

COMMERCIAL SYSTEMS INTEGRATION

INPUT

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COMMERCIAL SYSTEMS INTEGRATION

A PROTOTYPE STUDY

FOR

MARTIN MARIETTA

September 18, 1986

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INTRODUCTION

- o INPUT WAS ENGAGED BY MARTIN MARIETTA IN AUGUST 1986 TO ASSIST THE COMPANY IN THE EXPLORATION OF COMMERCIAL SYSTEMS INTEGRATION (CSI) MARKET.
- o BECAUSE OF THE COMPLEXITY OF CSI A PROTOTYPE APPROACH WAS TAKEN FOR THE STUDY. AS A PART OF THE ENGAGEMENT THE FOLLOWING ACTIVITIES WERE UNDERTAKEN:
 - INTERACTIONS WITH KEY TEAM MEMBERS TO DETERMINE PRIME INTEREST AND CONCERNS VIS-A-VIS COMMERCIAL SYSTEMS INTEGRATION.
 - BRIEFING AND REVIEW OF MAIN MARTIN MARIETTA CAPABILITIES AS THEY RELATE TO CSI.
 - SELECTION OF MANUFACTURING AS THE PROTOTYPE INDUSTRY BY MARTIN MARIETTA.

INPUT

INTRODUCTION (cont'd)

- QUESTIONNAIRE DEVELOPMENT BY INPUT TO INCLUDE ELEMENTS FROM ABOVE TWO ACTIVITIES PLUS OTHER ELEMENTS GAINED FROM INPUT'S EXPERIENCE IN PRIOR CSI STUDIES.
- QUESTIONNAIRE PREVIEW BY MARTIN MARIETTA PERSONNEL AND MINOR EMENDATIONS BY INPUT.
- ADMINISTRATION OF INTERVIEWS (76 QUESTIONS, 20 PAGE FORM) WITH MIS DECISION MAKERS IN 24 RANDOMLY SELECTED LARGE MANUFACTURING FIRMS. AVERAGE INTERVIEW DURATION WAS 41 MINUTES, A VERY LENGTHY INTERVIEW.
- ANALYSIS OF DATA GATHERED BY INTERVIEWERS INCLUDING APPROPRIATE STATISTICAL TESTS.
- DEVELOPMENT OF PRESENTATION REPORT AND COMMENTARY.

INPUT

INTRODUCTION (cont'd)

- o DURING THIS PRESENTATION QUESTIONS ARE WELCOME AS THEY OCCUR. IF NOT ANSWERABLE BASED ON THE DATA PRESENTED, INPUT WILL PERFORM ADDITIONAL ANALYSIS AS NEEDED.

INPUT

AREAS COVERED IN STUDY

- o DUE TO THE PROTOTYPE NATURE OF THIS STUDY A WIDE RANGE OF POTENTIALLY SIGNIFICANT VARIABLES ARE COVERED IN THE QUESTIONNAIRE. INCLUDED ARE:
 - DP EXPENDITURES AND TRENDS
 - COMMUNICATIONS EXPENDITURES AND TRENDS
 - FUTURE BUDGET GROWTH
 - EXPENDITURE ALLOCATION BY PERSONNEL, HARDWARE, SOFTWARE, SERVICES
 - SERVICES EXPENDITURES BREAKDOWN
 - IMPORTANCE AND ACTIVITY IN MAJOR AREAS SUCH AS COMMUNICATIONS NETWORK INTEGRATION
 - MAJOR DEVELOPMENT ACTIVITIES AND PLANS
 - PROJECT DESCRIPTION, EXPENDITURES, TYPE, OPERATING COST
 - EXISTENCE AND TYPE OF CONSTRAINTS (BUDGET, TECH, OTHER)
 - SYSTEMS DEVELOPMENT LIFE CYCLE ELEMENT IMPORTANCE

INPUT

AREAS COVERED IN STUDY (cont'd)

- PROJECT MANAGEMENT STRENGTHS AND IMPORTANCE
 - USE OF OUTSIDE FIRMS FOR SPECIFIC CSI-RELATED TASKS
 - USE OF CSI
 - ROLE OF SYSTEMS INTEGRATOR
 - PERCEPTION OF CSI SUITABILITY BY FIRM TYPE
 - PERCEIVED SENIOR MANAGEMENT VIEW OF CSI
 - BUSINESS ARRANGEMENTS
 - SUITABILITY OF SPECIFIC FIRMS
 - ITEMS SUPPLEMENTARY TO ABOVE
- o AS CAN BE SEEN VERY EXTENSIVE DATA WAS GATHERED AS A PART OF THE PROTOTYPE ACTIVITY. ITEMS BEST ANALYZED IN CROSS-INDUSTRY COMPARISONS OR THOSE OF MINOR SIGNIFICANCE WILL NOT BE PRESENTED IN THIS REPORT IN THE INTEREST OF BREVITY. ONLY MAJOR ITEMS WILL BE PRESENTED.

INPUT

EXPENDITURES

- o THE MEAN EXPENDITURE OF FIRMS FOR DP AND COMMUNICATIONS IN THE STUDY WAS \$139.5 MILLION IN 1985. THIS EQUATES TO \$3.35 BILLION FOR THE 24 FIRMS IN THE AGGREGATE.
- o AVERAGE ANNUAL EXPENDITURE GROWTH THROUGH 1990 WAS FORECAST BY RESPONDENTS (R'S) TO BE 8.7% PER YEAR AVERAGE. IN 1990 AGGREGATE EXPENDITURES FOR THE GROUP WILL INCREASE \$1.32 BILLION TO \$5.0 BILLION.
- o TOTAL EXPENDITURES DURING THE PERIOD WILL BE \$24.9 BILLION FOR THE YEARS 1985-1990 INCLUSIVE.
- o SINCE CSI INCLUDES EXPENDITURES FOR DP HARDWARE, COMMUNICATIONS EQUIPMENT, SOFTWARE AND PERSONNEL, OFTEN OVER A PERIOD OF TIME, A SIGNIFICANT PORTION OF THESE EXPENDITURES WOULD BE AVAILABLE.

INPUT

EXPENDITURES (cont'd)

- o IF WE ASSUME 1985 TO BE "BASE" EXPENDITURES (A CONSERVATIVE ASSUMPTION) THEN INCREMENTAL SPENDING AT THE 24 FIRMS WILL BE \$4.8 BILLION ON "NEW PROJECTS" DURING THE STUDY HORIZON. A PORTION OF THIS IS GENUINELY AVAILABLE FOR CSI.

INPUT

EXPENDITURE PROPORTIONS

EXPENDITURES BY CATEGORY:

	<u>NOW %</u>	<u>1989 %</u>
PERSONNEL	28.1	29.1
DP HARDWARE	19.2	20.1
COMM. EQUIP.	13.7	13.5
DATA TRANS	11.5	13.0
VOICE TRANS	12.6	8.4
SOFTWARE	11.6	12.2
OTHER	<u>3.3</u>	<u>3.7</u>
	100.0	100.0

- o NOTE THE RELATIVELY STABLE NATURE OF EXPENSE PROPORTIONS. THE ONLY MATERIAL CHANGE IS A REDUCED ALLOCATION TO VOICE EXPENDITURES. R'S EXPECT THIS TO BE CAUSED BY REDUCTIONS IN COST FOR LONG DISTANCE PRIMARILY. INPUT BELIEVES THIS IS EXCESSIVELY OPTIMISTIC.

INPUT

EXPENDITURE PROPORTIONS (cont'd)

- o OBSERVE THE STABLE - PERHAPS MATURE - DP ENVIRONMENT SUGGESTED BY THIS DATA. IN A STABLE ENVIRONMENT LONG-TERM (MULTI-YEAR) PROJECTS MAY BE UNDERTAKEN WITH LOWER RISK. THIS IS A POSITIVE FOR CSI AND MAY OFFSET THE RELATIVELY MODEST GROWTH RATE IN OVERALL EXPENDITURES.

INPUT

SOFTWARE EXPENDITURES - PROPORTIONS

	<u>NOW %</u>
INHOUSE SOFTWARE	39.4
THIRD PARTY PARCKAGES	37.5
EXTERNAL CUSTOM SOFTWARE	13.2
TURNKEY SYSTEMS	9.9

- o BECAUSE OF VERY LARGE VARIATIONS BETWEEN RESPONDENTS, THE DIFFERENCES BETWEEN NOW AND FUTURE DATA IS NOT STATISTICALLY SIGNIFICANT AT THE 90% CONFIDENCE INTERVAL. FUTURE IS NOT PRESENTED AS A RESULT.
- o NOTE, HOWEVER, THAT AMONG THESE R'S IN VERY LARGE COMPANIES EXTERNAL EXPENDITURES ON AVERAGE EXCEED INTERNAL SOFTWARE EXPENDITURES. THIS IS A MAJOR SHIFT FROM 5 YEARS AGO WHEN OUTSIDE SERVICES CONSTITUTED LESS THAN 20% OF SOFTWARE RELATED EXPENDITURES.

INPUT

SOFTWARE EXPENDITURES - PROPORTIONS (cont'd)

- o THIS SHARPLY INCREASED USE OF SERVICES MAY BE CONSIDERED A GENERIC POSITIVE IN THAT FAMILIARITY AND ACCEPTANCE OF OUTSIDE SERVICES IS A PRE-REQUISITE TO THE USE OF HIGHLY COMPLEX SERVICES SUCH AS COMMERCIAL SYSTEMS INTEGRATION. IN THE SOFTWARE AREA THIS HAS REACHED HISTORICALLY HIGH LEVELS.

INPUT

MAJOR ACTIVITY AREAS: PARTICIPATION & IMPORTANCE

<u>ACTIVITY</u>	<u>% ENGAGED</u>	<u>IMPORTANCE</u>	<u>% 4/5</u>
COMM. NETWORK INTEGRATION	100.0	4.4	91.3
MICRO/MAINFRAME LINK	100.0	3.5	60.9
PROD./PROC. AUTOMATION	91.3	3.5	52.2
OFFICE AUTOMATION	95.7	3.2	43.4
CORP. DB. DEVELOPMENT	91.3	3.1	39.1
DEPARTMENTAL COMPUTING	87.0	3.0	34.8
VOICE/DATA INTEGRATION	69.6	2.8	30.4
INDUSTRY DATA EXCHANGE	82.6	2.6	30.4

- o EIGHT MAJOR ACTIVITIES WERE TESTED. RESPONDENTS INDICATED WIDE-SPREAD PARTICIPATION IN ALL CATEGORIES. OF PARTICULAR SIGNIFICANCE IS THE BROAD RANGE OF ACTIVITIES IN WHICH MIS HAS A ROLE, "REACHING" FROM THE SHOP FLOOR TO OFFICES AND DEPARTMENTS.

INPUT

MAJOR ACTIVITY AREAS: PARTICIPATION & IMPORTANCE

(cont'd)

- o WHILE THE FRANCHISE IS BROAD, THE IMPORTANCE OF THESE AREAS VARIES CONSIDERABLY, AS THE IMPORTANCE RATINGS SHOW. R'S WERE ASKED TO RATE THE IMPORTANCE OF THE AREA ON A SCALE OF ONE TO FIVE (1-5) WITH "1" AS UNIMPORTANT AND "5" AS VERY IMPORTANT.
- o LEADING THE LIST WAS COMMUNICATION NETWORK INTEGRATION WITH A POWERFUL 4.4 RATING AND WITH 91.3% OF R'S CHARACTERIZING THIS ACTIVITY AS ABOVE AVERAGE IMPORTANCE.
- o IN SECOND PLACE IS MICRO/MAINFRAME LINKAGES AT 3.5 AND 60.9% AT THE 90% CONFIDENCE LEVEL, THIS IS SIGNIFICANTLY LESS IMPORTANT THAN NET INTEGRATION.

INPUT

MAJOR ACTIVITY AREAS: PARTICIPATION & IMPORTANCE

(cont'd)

- o IN THIRD PLACE IS PRODUCTION AND PROCESS AUTOMATION, A SOMEWHAT SURPRISING RANKING IN THE MFG. INDUSTRY AND WITH THE TRADE PRESS EMPHASIS ON CIM, FACTORY OF THE FUTURE, MAPS AND SIMILAR CONCEPTS.
- o WHILE THE BALANCE OF THE LIST IS PRESENTED IN RATING RANK ORDER, ONLY INDUSTRY DATA EXCHANGE ("EDI") IS STATISTICALLY SIGNIFICANTLY LESS IMPORTANT AT THE 90% LEVEL THAN PROD./PROC. AUTOMATION.
- o THIS DATA INDICATES THAT SERVICES TO MFG. ARE QUITE FEASIBLE WITHOUT EXTENSIVE "SHOP FLOOR" AUTOMATION SKILLS AND THAT THIS IS NOT THE MOST IMPORTANT ACTIVITY AREA IN MANUFACTURING FROM AN MIS PERSPECTIVE.
- o OBSERVE ALSO THAT EACH CATEGORY HAS AT LEAST A MINORITY WHICH CONSIDERS IT IMPORTANT. THESE ITEMS ALL HAVE A MATERIAL CONSTITUENCY.

INPUT

PROJECT EXPENDITURES

- o RESPONDENTS IN THE SAMPLE IDENTIFIED "MAJOR PROJECTS" WITH A VALUE OF \$930.5 MILLION FUNDED IN 1986.
- o PROJECT DURATIONS AVERAGED 2.5 YEARS WITH THE 90% CONFIDENCE INTERVAL ARRAYED BETWEEN 2.1 AND 3.0 YEARS. A HIGH OF 7 YEARS AND A LOW OF 1 YEAR WAS OBSERVED.
- o PROJECT EXPENDITURES (PER PROJECT) RANGED FROM \$350 MILLION TO \$200K, RENDERING A MEAN VALUE FOR PROJECT SIZE POTENTIALLY MISLEADING.
- o OF 21 PROJECTS COMPLETELY IDENTIFIED AS TO NATURE, EXPENSE, DURATION ETC., 8 PROJECTS EXCEEDED \$10 MILLION IN EXPENDITURES, ACCOUNTING FOR \$556 MILLION OR 59.7% OF TOTAL EXPENDITURES.

INPUT

PROJECT EXPENDITURES

- o OVERALL, PROJECT EXPENDITURES WERE APPORTIONED 65% "INHOUSE" AND 35% "OUTSIDE." AROUND THESE MEANS THERE IS SUBSTANTIAL VARIATION. THE 90% INTERVAL FOR INHOUSE IS 53.8 -77.7% AND FOR OUTSIDE THE INTERVAL IS 22.4 - 46.2%.
- o WE CONCLUDE THAT THERE ARE SUBSTANTIAL NUMBERS OF VERY LARGE PROJECTS OCCURING IN MANUFACTURING AND THAT MATERIAL USE IS MADE OF "OUTSIDE" SERVICES IN THE PROJECTS.

INPUT

LARGE PROJECT CHARACTERISTICS

- o PROJECTS ARE COMMUNICATIONS - INTENSIVE. AVERAGE TERMINALS EMPLOYED WAS 571, EXCLUSIVE OF ONE 25,000 TERMINAL PROJECT.
- o SAVE FOR ONE \$30 MILLION PROJECT, ALL PROCESSORS ENCOUNTERED WERE IBM.
- o PROJECT EXPENDITURES WERE ALLOCATED 38.9% FOR HARDWARE AND 61.1% SOFTWARE ON AVERAGE, 90% INTERVAL FOR HARDWARE EXPENSES WAS 30.5% AND 47.4%. FOR SOFTWARE, THE INTERVAL WAS 52.6-69.5%.
- o MOST RESPONDENTS WERE UNABLE TO ESTIMATE THE ANNUAL OPERATING EXPENDITURES ASSOCIATED WITH A PROJECT. WHEN ABLE, ESTIMATES WERE IN THE RANGE OF 20-25% THE COST OF DEVELOPMENT.
- o THIS DATA CONFIRMS THAT LARGE PROJECTS ARE "CONVENTIONAL" IN NATURE: IBM BASED, SOFTWARE INTENSIVE AND TELECOMMUNICATION INTENSIVE. THIS APPEARS TO FIT MARTIN'S CAPABILITY PROFILE.

INPUT

PROJECT TYPES

<u>TYPE</u>	<u>PROPORTION</u>
FINANCE	37%
ORDER ENTRY	18%
MANUFACTURING	18%
IND. SPECIALIZED	9%
COMM. NET	9%
OTHER	<u>9%</u>
	100%

- o OBSERVE THAT PROJECTS ARE VERY CONVENTIONAL.
- o FINANCE APPLICATIONS ARE THE MOST COMMON AND INCLUDE STANDARD APPLICATIONS SUCH AS ACCOUNTS RECEIVABLE AND PAYROLL (!).

INPUT

PROJECT TYPES (cont'd)

- o 44% OF PROJECTS WERE CONSIDERED UPGRADES, 13% CONSOLIDATIONS, 17% COMBINATIONS AND 26% WERE DESIGNATED AS "NEW." THIS IS A FURTHER INDICATION OF "GRADUAL" DEVELOPMENT IN TRADITIONAL AREAS. ALMOST 3 OUT OF 4 PROJECTS WERE "EXTENSIONS" OF EXISTING SYSTEMS.
- o ABOUT ONE FOURTH OF PROJECTS INVOLVE USER OUTSIDE THE U.S, I.E. ARE INTERNATIONAL IN NATURE.

INPUT

SERVICES IN SYSTEMS DEVELOPMENT

<u>ROLE</u>	<u>IMPORTANCE</u>	<u>% 4/5</u>
REQUIREMENTS DEFINITION	2.7	39
SYSTEMS DESIGN	2.9	39
PROGRAM SPECIFICATION	2.7	35
CODING	3.1	39
UNIT TESTING	2.8	35
SYSTEM TESTING	2.9	35
DOCUMENTATION	3.3	48
TRAINING	2.8	39

- o R'S WERE QUERIED ON THE IMPORTANCE OF THE ROLE OF THIRD PARTIES IN SYSTEMS DEVELOPMENT AT VARIOUS PROJECT STAGES.
- o DIFFERENCES IN RATINGS ARE NOT STATISTICALLY SIGNIFICANT. HISTORICALLY, CODING WOULD HAVE BEEN MUCH MORE IMPORTANT, THIS INDICATES A CHANGE IN ATTITUDE AND HEAVIER CURRENT RELIANCE ON THIRD PARTIES.

INPUT

SERVICES IN SYSTEMS DEVELOPMENT (cont'd)

- o OBSERVE THAT ROUGHLY 4 OUT OF 10 R'S PLACE HIGH IMPORTANCE ON THIRD PARTIES IN ALL THESE AREAS.
- o DATA INDICATES THAT FOR LARGE PROJECTS THIRD PARTIES ARE INVOLVED AT ALL STAGES IN A MATERIAL WAY.

INPUT

ORGANIZATIONAL CAPABILITY

<u>ACTIVITY</u>	<u>STRENGTH</u>	<u>IMPORTANCE</u>
DEVELOPING DETAILED BUDGETS	3.6	4.2
DEVELOPING PLANS & SCHEDULES	3.6	4.2
COMPLETION ON SCHEDULE		
COMPLETION W/IN BUDGET	3.9	4.4
OVERALL PROJECT MGMT.	3.8	4.3

- o THIS DATA INDICATES THAT RESPONDENTS ARE LESS CAPABLE IN KEY AREAS OF PROJECT MANAGEMENT THAN THEY BELIEVE THEY SHOULD BE.
- o DIFFERENCES ARE SIGNIFICANT AT THE 80% LEVEL ON THESE CSI-CRITICAL ACTIVITIES.
- o THERE IS A SUPRISING DEGREE OF CANDOR IN THESE RESPONSES. R'S ARE, IN EFFECT, ADMITTING THAT THEY NEED TO DO A BETTER JOB IN THE MANAGEMENT OR LARGE PROJECTS.

INPUT

PROFESSIONAL SERVICES USED

<u>SERVICE</u>	<u>% HAVE USED</u>	<u>% WILL USE</u>
CONTRACT PROGRAMMING	91	87
TRAINING	82	87
NETWORK DESIGN	52	74
SYSTEMS INTEGRATION	44	56
MAINTENANCE	78	78

- o THIS DATA SHOWS STABILITY IN TYPES OF SERVICES USED (AND CLAIMED HIGH USAGE) FOR MOST SERVICES TESTED.
- o STATISTICALLY SIGNIFICANT INCREASES ARE FOUND IN TWO CATEGORIES:
 - NETWORK DESIGN
 - SYSTEMS INTEGRATION
- o THIS SUGGESTS THAT NETWORK DESIGN COULD CONSTITUTE AND ENTRY POINT FOR CSI.

INPUT

PROFESSIONAL SERVICES USED

- o IT ALSO SHOWS THAT SYSTEMS INTEGRATION OF SOME TYPE WILL INCREASE IN THE FUTURE. UNFORTUNATELY, THE TERM "SYSTEMS INTEGRATION" HAS BEEN SUBJECT TO A VARIETY OF DEFINITIONS IN THE PAST AND WHAT IS PRESENT IN THE MINDS OF R'S IS NOT CLEAR IN THIS CONTEXT.
- o TO CLARIFY THE ISSUE A DEFINITION WAS PROVIDED.

INPUT

CSI DEFINITION AND USE

- o THE CSI DEFINITION EMPLOYED WITH MARTIN MARIETTA APPROVAL WAS:
"A SINGLE FIRM WOULD UNDER TAKE RESPONSIBILITY FOR THE DESIGN, DEVELOPMENT AND IMPLEMENTATION OF A SYSTEM OR SUB-SYSTEM. THIS COULD INCLUDE THE INTEGRATION OF THE HARDWARE, SOFTWARE AND COMMUNICATIONS FACILITIES REQUIRED. WHEN THE SYSTEM OR SUB-SYSTEM WAS COMPLETE AND FULLY TESTED, IT WOULD BE TURNED OVER TO YOU FOR OPERATION."
- o UNDER THIS DEFINITION 21% OF RESPONDENTS INDICATED THEY HAD USED THIS APPROACH OF THE 24 QUERIED. THIS COMPARES TO 44% RESPONDING AFFIRMATIVELY TO "GENERAL" USE OF SYSTEMS INTEGRATION.
- o APPLICATIONS STATED BY RESPONDENTS WERE ALL OF A NETWORK NATURE AND INVOLVED SOFTWARE AS WELL. TWO RESPONDENTS REFUSED TO DIVULGE THE NATURE OF THE APPLICATION INVOLVED.

INPUT

CSI DEFINITION AND USE (cont'd)

- o AS IN THE EARLIER DATA, THIS SUGGESTS COMMUNICATIONS AS A KEY EMPHASIS AREA FOR CSI IN MANUFACTURING.

INPUT

CHARACTERISTICS OF C.S. INTEGRATOR

<u>CHARACTERISTIC</u>	<u>IMPORTANCE</u>	<u>% 4/5</u>
O/A PROJECT MGMT	3.7	65.2
REQUIREMENTS DEFINITION	3.8	56.5
O/A SYSTEM DESIGN	3.8	60.8
SELECT HWARE, SWARE, COMM.	3.6	56.5
INTEGRATE HWARE, SWARE, COMM.	3.9	69.6
DESIGN CUSTOM HARDWARE	2.5	13.0
INTEGRATE VOICE/DATA	2.6	17.4

- o OBSERVE THAT THE FIRST FIVE ITEMS ARE ALL OF APPROXIMATELY EQUAL IMPORTANCE. NOTE ESPECIALLY THE HIGH RATING OF REQUIREMENTS DEFINITION WHICH IMPLIES EARLY PARTICIPATION IN PROJECT FORMATION STAGE.
- o THERE IS NO MATERIAL REQUIREMENT FOR CUSTOM HARDWARE AND NONE FOR VOICE/DATA INTEGRATION EITHER.

INPUT

CHARACTERISTICS OF C.S. INTEGRATOR (cont'd)

- o THE ABSENCE OF CUSTOM HARDWARE AND THE NEED FOR PROJECT DEFINITION PROBABLY DRAW A RELATIVELY SHARP BOUNDARY BETWEEN COMMERCIAL AND FEDERAL S.I.

INPUT

CSI BY FIRM TYPE

<u>TYPE</u>	<u>1 YEAR</u>		<u>3 YEARS</u>	
	<u>RATING</u>	<u>% 4/5</u>	<u>RATING</u>	<u>% 4/5</u>
PROFESSIONAL SERVICES	2.3	17.4	2.7	21.7
AEOSPACE FIRM	2.4	17.4	2.5	17.4
COMPUTER MFG.	2.4	26.0	2.7	30.4
COMMUN. SUPPLIER	2.2	13.0	2.8	34.8

- o R'S WERE QUERIED ON "HOW LIKELY" THEY WERE TO MAKE USE OF FOUR FIRM TYPES FOR CSI IN ONE YEAR AND IN THREE YEARS WITHA RATING OF "ONE" INDICATING VERY UNLIKELY AND "FIVE" INDICATING VERY LIKELY.
- o THE DIFFERENCES BETWEEN MEANS ARE NOT STATISTI-
CALLY SIGNIFICANT AT THIS SAMPLE SIZE.

INPUT

CSI BY FIRM TYPE (cont'd)

- o NOTE, HOWEVER, THE CHANGE IN "LIKELY" PROPORTIONS AND PARTICULARLY THE INCREASE IN LIKELY USE OF A COMMUNICATIONS SUPPLIER FOR CSI. ALSO OBSERVE THE CONTINUOUS RELATIVE STRENGTH OF THE COMPUTER MANUFACTURER CATEGORY. RECOLLECT THAT THESE ARE TENDENCIES, NOT ITEMS WITH STATISTICAL SIGNIFICANCE.
- o DUE TO THE EMERGING NATURE OF THIS MARKET THE FOUR FIRM TYPES TESTED ARE NOT YET HEAVILY DIFFERENTIATED. THIS MAY BE CONSIDERED A POSITIVE FOR MARTIN IF ENTRY IS ELECTED.
- o THE USE OF A SYSTEMS INTEGRATOR FOR CURRENT PROJECTS RATED 1.8 (8.7% LIKELY). THIS IS STATISTICALLY SIGNIFICANTLY LOWER (AT 90% CONFIDENCE INTERVAL) THAN THE ONE AND THREE YEAR RATINGS. ACCORDINGLY, WE WOULD EXPECT A MARKET INCREASE IN CSI ACCEPTANCE IN THE FUTURE BY MIS MANAGEMENT.

INPUT

CSI BY FIRM TYPE

- o R'S WERE ALSO QUERIED ABOUT SENIOR MANAGEMENT LIKELIHOOD OF CSI ACCEPTANCE. RESPONDENTS RATED SENIOR MANAGEMENT AT 3.3 CURRENTLY WITH 47.8% LIKELY. THIS IS SIGNIFICANTLY HIGHER AT THE 90% LEVEL AND WOULD SUGGEST THAT ANY MARTIN EFFORTS TARGET SENIOR MANAGEMENT FOR MARKETING ATTENTION.

INPUT

BUSINESS TERMS PREFERENCES

<u>ARRANGEMENT</u>	<u>PREFERENCE</u>	<u>% 4/5</u>
FIXED PRICE, PERF. GUAR.	4.5	87.0
FIXED PRICE	3.1	30.4
T & M	2.6	30.4
COST PLUS	1.8	0.0

- o FOUR BASIC BUSINESS ARRANGEMENTS WERE TESTED. OF THESE, FIXED PRICE CONTRACT WITH A PERFORMANCE GUARANTEE WAS OVERWHELMINGLY PREFERRED.
- o FIXED PRICE AND TIME AND MATERIALS ARRANGEMENTS ARE SIGNIFICANTLY LESS VALUED (WITH NO "5" RATINGS).
- o SIGNIFICANTLY LESS PREFERRED THAN F/P OR T&M IS COST PLUS. THIS LATTER SHOULD BE CONSIDERED AS UNACCEPTABLE TO THE MARKET.

INPUT

BUSINESS TERMS PREFERENCES (cont'd)

- o THE KEY TO SUCCESS WITH THESE RESPONDENTS IS THE "PERFORMANCE GUARANTEE." THIS IS A RISK "TRADE-OFF" FOR R'S. IN THE DIMINISHED CONTROL ROLE IMPLIED BY CSI THEY SEEK MAXIMUM ASSURANCE OF SUCCESS. INPUT BELIEVES THAT THIS "GUARANTEE" WILL BECOME MANDATORY FOR SUCCESS.

INPUT

COMPANY AS SOURCES

<u>COMPANY</u>	<u>SATISFACTION</u>	<u>% 4/5</u>
IBM	3.6	43.5
DEC	3.4	34.8
EDS	3.4	34.8
HP	3.3	34.8
BOEING	3.3	30.4
MCDONNELL	3.1	30.4
CSC	3.1	30.4
MARTIN MARIETTA	2.9	13.0
CDC	2.8	13.1
CULLINET	2.8	26.1
SPERRY	2.7	17.4
G.E.	2.7	13.0
AT&T	2.7	17.4
SYSTEM DEV.	2.7	4.4
PRC	2.6	4.4

INPUT

COMPANY AS SOURCES (cont'd)

- o RESPONDENTS WERE ASKED TO RATE HOW SATISFACTORY SPECIFIC FIRMS WOULD BE IN "SYSTEMS INTEGRATION IN THE FUTURE."
- o WHILE IBM HEADS THE LIST, A RATING BELOW 2.8 IS NECESSARY TO BE STATISTICALLY SIGNIFICANTLY LESS SATISFACTORY THAN IBM. THIS MEANS THAT DEC, EDS, HP, BOEING, CSC, MCDONNELL AND MARTIN MARIETTA ARE ABOUT EQUALLY SATISFACTORY, ALTHOUGH MARTIN BY THE SLIMMEST OF MARGINS.
- o SPERRY, G.E., AT&T, SYSTEM DEVELOPMENT AND PRC ARE STATISTICALLY SIGNIFICANTLY LESS SATISFACTORY AS SOURCES.
- o AT THESE RATING NO COMPANY IS GENUINELY UNSATISFACTORY.

INPUT

COMPANY SOURCES (cont'd)

- o % 4/5 (HIGH SATISFACTION) IS TAKEN TO BE LARGELY A FAMILIARITY INDEX. MANY FIRMS WITH THE HIGHER PROPORTIONS HAVE BEEN MARKETING TO RESPONDENTS FOR MANY YEARS.
- o FASCINATINGLY LOW IS AT&T. THIS WOULD SUGGEST THAT THE AT&T/EDS JOINT VENTURE WILL FARE LESS WELL THAN EDS ALONE.
- o INTERESTINGLY "HIGH" IS MCDONNELL DOUGLAS. FACTORS BEHIND THE RELATIVELY STRONG 4/5 PROPORTION ARE NOT CURRENTLY KNOWN.
- o WE CONCLUDE THAT IN THIS EARLY STAGE OF CSI MARKET DEVELOPMENT NO FIRM HAS A COMMANDING LEAD, MUCH LESS AN INVINCIBLE POSITION. FUTURE ACTIONS WILL BE MORE IMPORTANT THAN PRESENT RANKING ON THIS LIST.

INPUT

SUMMARY

- o RECOLLECTING THAT THIS DATA APPLIES ONLY TO LARGE MANUFACTURERS AND THAT OTHER INDUSTRIES WILL DIFFER IN IMPORTANT WAYS, THE FOLLOWING WAS FOUND:
 - OVERALL BUDGETS ARE LARGE AND EXPECTED TO INCREASE AT A MODERATE 8.7% RATE IN THE FUTURE. TOTAL EXPENDITURES BY THESE FIRMS WILL BE ABOUT \$25 BILLION THROUGH 1990.
 - VERY SUBSTANTIAL EXPENDITURES ARE BEING MADE "OUTSIDE" THE MIS DEPARTMENT. THESE EXPENDITURES FOR SOFTWARE, COMMUNICATIONS AND EQUIPMENT ARE POTENTIALLY AVAILABLE FOR COMMERCIAL SYSTEMS INTEGRATION.
 - HIGH NEED AREAS IN MANUFACTURING INCLUDE COMMUNICATIONS NETWORK INTEGRATION, MICRO/MAINFRAME AND PRODUCTION/PROCESS AUTOMATION, ALL CONSIDERED "VERY" IMPORTANT BY AT LEAST HALF OF RESPONDENTS.

INPUT

SUMMARY (cont'd)

- \$930.5 MILLION IN PROJECT EXPENDITURES HAD BEEN FUNDED AS OF 1986 WITH A MEAN DURATION OF 2.5 YEARS.
- THERE ARE MANY LARGE PROJECTS IN EXCESS OF \$10 MILLION IN EXISTENCE WHICH WOULD BE "AMENABLE" TO CSI. FOR THESE PROJECTS AN AVERAGE OF 35% OF EXPENDITURES ARE "OUTSIDE" BUT VARIABILITY IS CONSIDERABLE.
- LARGE PROJECTS ARE COMMUNICATIONS - INTENSIVE, BASED ON IBM HARDWARE AND ARE PRINCIPALLY SOFTWARE RELATED AT 61.1% OF TOTAL EXPENSE.
- PROJECT TYPES ARE NOT EXOTIC. FINANCIAL AND ORDER ENTRY SYSTEMS ACCOUNT FOR ABOUT HALF OF ALL PROJECTS. MANUFACTURING - SPECIALIZED SYSTEMS ACCOUNT FOR ABOUT 1/5 OF PROJECTS.
- SERVICES MAY BE EMPLOYED AT ALL PROJECT STAGES FROM REQUIREMENTS DEFINITION THROUGH DOCUMENTATION AND TRAINING.

INPUT

SUMMARY (cont'd)

- THERE IS SOME GAP BETWEEN EXISTING PROJECT SKILLS AND NEEDED PROJECT SKILLS, A POSITIVE FOR CSI.
- COMMUNICATIONS NETWORKING NEEDS ARE A RECURRING REFRAIN THROUGHOUT QUESTION SEGMENTS.
- ONLY LIMITED USE OF SYSTEMS INTEGRATION HAS BEEN MADE IN THE PAST. BASED UPON RESPONSES, THIS IS EXPECTED TO INCREASE MARKEDLY IN THE FUTURE.
- NO COMPANY HAS A TRULY DOMINANT POSITION IN WHAT IS AN EMERGING MARKET. MARTIN MARIETTA IS SEEN BY RESPONDENTS AS A POTENTIALLY VIABLE SOURCE FOR CSI, AS AREA NUMBER OF OTHER FIRMS.
- OVERALL, INPUT SEES THE MANUFACTURING SECTOR AS A VIABLE ONE FOR COMMERCIAL SYSTEMS INTEGRATION AND MARTIN MARIETTA AS A POTENTIAL PARTICIPANT.

INPUT

INFORMAL OBSERVATIONS

- o AS IS PROBABLY CLEAR, COMMERCIAL SYSTEMS INTEGRATION DIFFERS MARKEDLY FROM FEDERAL IN THAT RESPONDENTS CAN SEEK ASSISTANCE AT ANY STAGE, INCLUDING THE VERY EARLY ONES. THERE WILL BE FEW, IF ANY, RFP'S.
- o IN THE COMMERCIAL SECTOR COMPANIES MAY ACT AS THEIR OWN PRIME. THIS MEANS THAT CSI IS COMPETITIVE WITH MORE TRADITIONAL SERVICE MODES SUCH AS PACKAGED SOFTWARE, PROFESSIONAL SERVICES AND, OF COURSE, "IN-HOUSE."
- o SINCE COMPETITION IS LIKELY TO BE MORE VARIED AND REQUIREMENTS LESS WELL-SPECIFIED "IN-FRONT," A DIFFERENT SALES/MARKETING APPROACH SEEMS INDICATED.

INPUT

INFORMAL OBSERVATIONS (cont'd)

- o BEGIN BY NOTING THAT SENIOR EXECUTIVES ARE MORE AMENABLE TO CSI THAN MIS EXECUTIVES. WE WOULD THEREFORE SUGGEST A STRATEGY THAT FOCUSES ON THE MORE AMENABLE EXECUTIVES.
- o INITIALLY, MARTIN MIGHT USE ITS EXECUTIVE STAFF TO "TROLL" FOR LEADS AMONG FIRMS WITH WHOM RELATIONSHIPS EXIST. THIS CAN BE QUITE INFORMAL, "NINETEENTH HOLE" ACTIVITY. SUCH ACTIVITY WILL IDENTIFY NEEDS AND LARGELY UNFORMED REQUIREMENTS.
- o THE TASK THEN BECOMES ONE OF GIVING LIFE TO THE NEEDS IN THE FORM OF REAL SYSTEMS. TO ACCOMPLISH THIS "TEAMS" WILL BE NEEDED. THESE COULD INCLUDE SENIOR MARTIN EXECUTIVES, MARKETING, SALES AND TECHNICAL PERSONNEL WHO, ON SHORT NOTICE, WOULD BE ABLE TO COMMAND THE RESOURCES NECESSARY FOR STUDIES AND RESPONSIVE PROPOSALS. FEASIBILITY STUDIES MAY BE A SOURCE OF REVENUE GENERATION.

INPUT

INFORMAL OBSERVATIONS (cont'd)

- o IN THE EARLY STAGES CSI WILL BE AN "INTANGIBLE" SALE REQUIRING SPECIAL TALENTS. THE ABILITY TO BE COMFORTABLE IN "LOW DEFINITION" ROLES WILL BE VERY IMPORTANT.
- o THE ABILITY TO MAKE A CLIENT AT EASE IN A GENERAL SENSE, THE ABILITY TO PROJECT COMPETENCE AND SIMILAR ASPECTS WILL BE MORE IMPORTANT THAN TECHNICAL KNOWLEDGE. THE BEST EARLY BUYERS OF THESE SYSTEMS WILL NOT BE TECHNICAL PEOPLE BUT MARTIN MUST HAVE TECHNICAL PEOPLE AVAILABLE TO WORK WITH THEIR COUNTERPARTS IN POTENTIAL CLIENT ORGANIZATIONS. PEER TEAMS ARE LIKELY AN APPROPRIATE APPROACH.

INPUT

INFORMAL OBSERVATIONS (cont'd)

- o IT SHOULD BE REMEMBERED THAT FROM THE CLIENT'S PERSPECTIVE THE FATE OF THE BUSINESS IS IN THE HANDS OF THE INTEGRATOR. THERE WILL BE ANXIETY ABOUT RISK, CONTROL, TIMING AND BUDGETS THAT ONLY PERFORMANCE CAN ACTUALLY RELIEVE. SUCCESSFUL VENDORS OF CSI WILL LEARN TO REDUCE THIS ANXIETY. IN PART, THIS WILL BE ACCOMPLISHED BY "PHASED" APPROACHES TO THE PROJECTS WITH FEASIBILITY STUDIES, PROTOTYPES, MODULES AND OTHER TECHNIQUES.
- o CSI WILL BE A HIGHLY CHALLENGING FORM OF INTANGIBLE SALE UNTIL EXPERIENCE IS GAINED BY BOTH USERS AND VENDORS WHICH WILL REGULARIZE THE PROCESS. WE WOULD SPECULATE THAT IF HIGHLY SUCCESSFUL, COMMERCIAL SYSTEMS INTEGRATION WILL GRADUALLY APPROACH FEDERAL INTEGRATION IN SOME OF ITS CHARACTERISTICS SUCH AS BIDDER'S CONFERENCES, FORMAL SPECIFICATIONS, EVALUATION PROCEDURES AND SIMILAR ITEMS.

INPUT

